

**BREEDING ACTIVITY OF SNAIL KITES IN THE
"STAIR-STEP UNIT" OF EVERGLADES NATIONAL PARK
AND BIG CYPRESS NATIONAL PRESERVE**

Everglades National Park
40001 State Road 9336
Homestead, FL 33034-6733
Permit No. 19990004

and

Big Cypress National Preserve
33100 Tamiami Trail
Ochopee, FL 34141

1999 Report

prepared by

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ABSTRACT

During spring 1999, the "stair-step" unit of Everglades National Park and Big Cypress National Preserve were surveyed to determine the breeding activity of Snail Kite (*Rostrhamus sociabilis plumbeus*). A total of five nests were located throughout the study area. Annual nest success, was 60%. This success rate was relatively high compared to other wetland units surveyed during 1999, and this is above the average range, 32%-50%, reported by previous studies. While previous studies have stated hydrology to be a factor affecting nest success, recent studies have not found hydrology directly linked to the success of nests. Low nest success may be a result of unfavorable breeding habitat, including low apple snail densities and changes in vegetation structure. The number of young produced per successful nest was

INTRODUCTION

The Snail Kite (*Rostrhamus sociabilis plumbeus*) is a medium sized raptor that inhabits flooded freshwater areas and shallow lakes in peninsular Florida and Cuba (Sykes 1984, Sykes et al. 1995). Historically, more than one-fourth of the Florida peninsula was covered with flooded wetlands (Beissinger 1986). In the early 1900s, various impoundments, levees, dikes, and canals, were constructed to drain and control the vast amount of flooded wetland areas for agricultural and urban development. This drainage effort resulted in the lost of over half of the wetlands in this region (Weaver et al. 1994) and those that remain have experienced, and continue to experience, substantial degradation from drainage, impoundment, changes in water flow regimes, increased nutrient loadings, and invasion by exotic plants and animals (Walters et al. 1992, Davis and Ogden 1994). With the lost and degradation of these wetlands, declines in wildlife populations occurred (Davis and Ogden 1994). In particular, in the 1950s and 1960s, the Snail Kite population was reported to be fewer than 40 individuals (Sykes 1979). This decline resulted in the federal listing of the Snail Kite in 1967 under the Endangered Species Conservation Act, the predecessor of the current Endangered Species Act (US Fish and Wildlife Service 1999).

Due to the reduction in geographic extent and its endangered status, it is imperative to understand the Snail Kite in relation to the remaining wetland habitat and its variability. Today, the Snail Kite resides in central and southern Florida in the watersheds of the Everglades, Lake Okeechobee, Kissimmee River, Loxahatchee Slough, and the Upper St. Johns River. Because Snail Kites feed almost exclusively on one species of aquatic apple snail (*Pomacea paludosa*), their survival depends on the appropriate hydrological conditions for apple snails occurring in at least a subset of wetlands across the region each year.

Long-term research questions regarding Snail Kites are based on conservation and restoration agendas. Currently, large scale ecosystem restoration efforts are being implemented and/or planned (e.g, the Central and South Florida Project Restudy, Upper St. Johns River Restoration Project, Kissimmee River Restoration, and the South Florida Ecosystem Restoration Initiative). Due to the reduction in geographic extent and the current restoration efforts, it is imperative to understand the population dynamics of the Snail Kite in relation to the remaining habitat and its variability. The purpose of this report is to report the breeding activities of Snail Kites in the "stair-step unit" of Everglades National Park (hereafter ENP) and Big Cypress National Preserve (hereafter BICY). The data consists of estimates of nesting success and the locations of Snail Kites banded in ENP or BICY between 1992 and 1998.

STUDY AREA AND METHODS

The "stair-step unit" in ENP and BICY (hereafter ENP-BICY) is south of Tamiami Trail in Lostman's, Dixon's, and East Slough (Fig. 1). The vegetation structure varies throughout the landscape consisting of land hammocks; strands or domes of cypress (*Taxodium* spp.), patches of sawgrass (*Cladium jamaicense*) marsh interspersed with woody plants, such as, willow (*Salix caroliniana*) and pond apple (*Annona glabra*) and open sloughs.

ENP-BICY was searched for nesting Snail Kites on 2 March and 24 March by airboat. Due to dry hydrologic conditions airboat surveys ceased prior to the completion of the nesting season (June-July). On 19 April helicopter surveys were conducted by BICY personnel (D. Jansen) and Snail Kite biologists (V. Dreitz and J. Duberstein) to check the status of nests observed on surveys prior to 19 April.

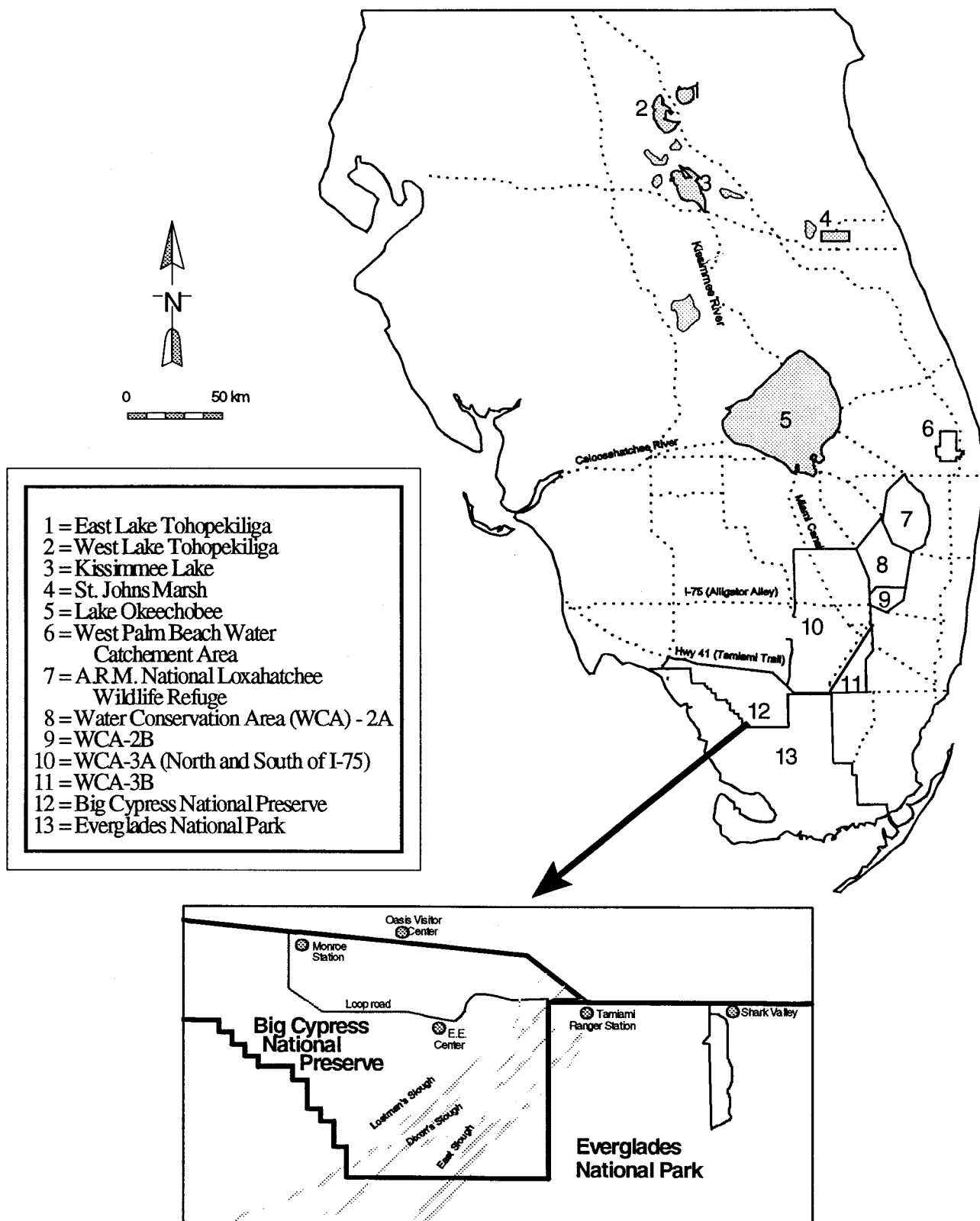


Figure 1. Everglades National Park and Big Cypress National Preserve in relation to other wetland areas monitored for Snail Kite nesting activity in central and southern Florida during the 1999 breeding season.

Nest monitoring followed guidelines suggested by Bennetts (1996) and Bennetts et al. (1988). A nest was defined as a structure with at least one egg present (Steenhof 1987). The location of a nest was determined by a Global Positioning System (GPS). Water depth was measured near the nest by placing a meter stick vertically into the water until it rested on the sediment. The nesting substrate and nest height were also recorded. Nests were checked using a mirror pole to determine status. A nest was considered successful if at least one nestling survived to 80% (24 days) of the average age at first flight (30 days) (Steenhof and Kochert 1982).

RESULTS

We observed five active nests during the 1999 breeding season in ENP-BICY. These nests were located in Dixon's Slough and Lostman's Slough.

The nest success in ENP-BICY for 1999 was 0.60 (Table 1). The number of young produced per successful nest was 2.0 and 1.0 young per nest. Nest site characteristics are available in Table 1. Due to the small sample size (n=5 nests) we refrained from conducting an analysis to look at any factors that may affect nest success.

Table 1. Snail Kite nesting data for nest located in the Big Cypress National Preserve during 1999 breeding season.

Nest	Latitude	Longitude	Nest Substrate	Nest Height (ft)	Water Depth at Initiation (m)	Status	Number of Young
12	25 37 222	81 00 893	Pond Apple	5.5	0.408	Failed	--
34	25 36 901	81 01 404	Palm	6	0.188	Failed	--
35	25 36 901	81 01 527	Mangrove	6.5	0.282	Successful	2 young
36	25 38 155	81 01 877	Mangrove	7	0.365	Successful	2 young
1000	25 37 921	81 01 640	Mangrove	8	0.300	Successful	1 young

Sightings of Banded Snail Kites in Everglades National Park and Big Cypress National Preserve

During 1999, 18 Snail Kites that were originally banded in ENP-BICY between 1995 and 1998 were observed throughout central and southern Florida (Table 2). Individuals were observed in the following wetland areas: ENP-BICY, Water Conservation Area (WCA)-3A, and the St. Johns River Water Management Area.

Table 2. Snail Kites that were originally banded in Everglades National Park and Big Cypress National Preserve between 1995-1998 and sighted during the 1999 breeding season.

YOB	B Age ²	Sex	Band ID (leg-color-#)	Location	Date	Comments
96	JUV	F	R-BLACK-AM	WCA3A	5/18	
96	JUV	F	R-BLACK-AT	WCA3A	4/30	
95	JUV	F	R-BLACK-C2	WCA3A	6/12	
96	JUV	F	R-BLACK-CG	WCA3A	6/3	
95	JUV	M	R-BLACK-D4	WCA3A	3/12	
96	JUV	M	R-BLACK-D7	WCA3A	4/5	
95	JUV	F	R-BLACK-D8	WCA3A	4/5	
95	JUV	F	R-BLACK-KI	WCA3A	4/16	
96	JUV	?	R-BLACK-K9	WCA3A	5/19	
95	JUV	M	R-BLACK-R4	WCA3A	5/7	
95	JUV	M	R-BLACK-R7	WCA3A	4/30	
95	JUV	F	R-BLACK-S4	WCA3A	5/19	
95	JUV	F	R-BLACK-U1	SJM	4/1	Unsuccessful Breeding Attempt
95	JUV	M	R-BLACK-V5	WCA3A	4/30	Successful Breeding Attempt
95	JUV	M	R-BLACK-AW	ENP-BICY	3/2	
95	JUV	M	R-BLACK-BN	ENP-BICY	3/2	
98	JUV	?	R-BLACK/RED-85	ENP-BICY	4/5	
98	JUV	?	R-BLACK/RED-W5	SJM	4/26	

¹ YOB=Year of Birth if known.

² B Age=Age at the time of Banding

³ Locations: ENP-BICY="Stair-step" unit in Everglades National Park and Big Cypress National Preserve, SJM=St. Johns River Water Management Area, and WCA-3A=Water Conservation Area 3A

DISCUSSION

Nest success in ENP-BICY was relatively high during the 1999 breeding season. The reason for this is unknown. In 1999, however, the breeding activity for Snail Kites in central and southern Florida was relatively low with the majority of the breeding activity occurring on Lake Kissimmee (Dreitz pers. comm). Further, overall nesting success for Snail Kites in 1999 was 27% using Mayfield method (26% using the number of successful nests/number of nests). This estimate is below the average range, 32%-50% reported by on previous studies (see review by Sykes et al. 1995), however, excludes nesting activity on Lake Kissimmee. We currently collaborate with the Florida Fish and Wildlife Conservation Commission (FFWCC) with nesting monitoring on the Kissimmee Chain of Lakes. Nest monitoring on Lake Kissimmee is conducted by Jim Rodgers, FFWCC and on East Lake Tohopekaliga and West Lake Tohopekaliga by Jon Buntz, FFWCC.

Dreitz et al. (submitted) showed that hydrology and hydrological states (ie., drought or non-drought) do not directly affect nesting success. However, hydrology may affect other aspects of reproduction, such as, choosing to breed or not, fledgling survival, or nesting habitat quality. Hydrological conditions in the southern portion (ie., Water Conservation Areas) was anecdotally observed to be lower than in previous years (since 1996), however, this has not been quantitatively assessed (Dreitz pers. comm). Previous recommendations for the management of Snail Kites emphasize the need for continuous flooding of wetland habitats (e.g., Stieglitz 1965, Stieglitz and Thompson 1967, Beissinger 1982, 1988). In contrast, Bennetts and Kitchens 1997 and Kitchens et al. (in press) state that prolonged hydroperiods, without occasional dry-downs, lead to vegetation changes reducing suitable nesting habitats.

For Snail Kites, habitat quality is dependent on hydrology and vegetation communities that support their principal food source, the apple snail. The fragmentation of the major wetlands in the network that Snail Kites use has altered the historical dynamics of wetlands. Prolonging the hydroperiods of the existing wetlands in the Snail Kite's range, counters the natural dynamics under which these wetlands evolved (Bennetts and Kitchens 1997, Kitchens et al. In press). While the effects of the lower hydrological conditions in the southern portion of the kites' range during 1999 may have resulted in low reproductive attempts (negative short-term effects), we fully recognize its importance in maintaining the viability of the Snail Kite (positive long-term effects). We recommend the continuation of adaptive management and conservation plans that not only address Snail Kite population dynamics, but that also, the plant community and apple snail dynamics.

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